



TENNESSEE DEPARTMENT OF

EDUCATION

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Computer Systems

Primary Career Cluster:	Information Technology
Consultant:	Bethany King Wilkes, (615) 532-2844, Bethany.Wilkes@tn.gov
Course Code(s):	6094
Recommended Prerequisite(s):	Information Technology Foundations (6095), Algebra I (3102)
Credit:	1
Grade Level:	10-11
Aligned Student Organization(s):	Skills USA: www.tnskillsusa.com Brandon Hudson, (615) 532-2804, Brandon.Hudson@tn.gov
Teacher Resources:	http://www.tn.gov/education/cte/InformationTechnology.shtml

Course Description

Computer Systems is designed to prepare students with work-related skills and for certification in the information technology industry. Content provides students the opportunity to acquire knowledge and skill in both theory and practical applications pertaining to troubleshooting, replacing, installing, and upgrading computers. Upon completion of the course students will possess a thorough knowledge of modern personal computer hardware. Procedures used in this course will evaluate students in theory and practical applications through written, hands-on, and computer-based virtual simulations. Successful mastery of the course content will prepare students to concentrate in computer support, which will prepare students with skills in PC repair, diagnostics, and installation to obtain the IT industry standard, CompTIA's A+ certification.

It is strongly recommended that administration and guidance follow the scope and sequence and course recommendations as listed.

Course Standards

Standard 1.0

Students will interpret and demonstrate the principles of industrial safety standards associated with the information technology industry.

The student will:

- 1.1 Implement the industrial safety standards established by the Environmental Protection

- Agency (EPA) and Occupational Safety and Health Administration (OSHA).
- 1.2 Identify and categorize safety hazards and prevention in the information technology industry.
- 1.3 Exhibit acceptable dress and personal grooming determined by the information technology industry.

Sample Performance Task

- Conduct a self-inspection of the laboratory and identify modifications necessary for compliance with rules, regulations, and standards of governing agencies.

Standard 2.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

The student will:

- 2.1 Cultivate positive leadership.
- 2.2 Participate in SkillsUSA as an integral part of classroom instruction.
- 2.3 Assess situations and apply problem-solving and decision-making skills within the school, community, and workplace.
- 2.4 Participate as a team member.

Sample Performance Task

- Create a leadership inventory and use it to conduct a personal assessment.

Standard 3.0

Students will evaluate career opportunities and career paths within the information technology industry.

The student will:

- 3.1 Develop a profile of career opportunities.
- 3.2 Develop a personal education/career roadmap.
- 3.3 Project future career opportunities within the information technology industry.

Sample Performance Task

- Develop a list of career opportunities, including education requirements, responsibilities, and salary ranges.

Standard 4.0

Students will analyze the growth and development of the information technology industry to gain insight regarding past, current, and future trends of the information technology industry.



The student will:

- 4.1 Trace the evolution of computers, networking, the Internet, and the Web.
- 4.2 Identify people in history who helped to shape the information technology industry.
- 4.3 Analyze current cultural and economic indicators to anticipate future trends in the information technology industry.
- 4.4 Explore economic aspects, the free enterprise system, and the role of government as they relate to the information technology industry.

Sample Performance Task

- Research industry history, trends, and pioneers in computer, Internet, and Web development from the Internet, media research, interviews, and other research sources.

Standard 5.0

Students will install, configure and maintain personal computer components.

The student will:

- 5.1 Identify the names, purposes, and characteristics of storage devices and backup media.
- 5.2 Identify the names, purposes, and characteristics of motherboards based upon features.
- 5.3 Identify the names, purposes, and characteristics of power supplies.
- 5.4 Identify the names, purposes, and characteristics of Central Processing Units.
- 5.5 Identify the names, purposes, and characteristics of cooling methods and devices.
- 5.6 Identify the names, purposes, and characteristics of memory types.

Sample Performance Task

- Build a new Personal Computer.

Standard 6.0

Students will detect problems, troubleshoot and repair/replace personal computer components.

The student will:

- 6.1 Recognize the basic aspects of troubleshooting theory.
- 6.2 Identify and apply basic diagnostic procedures and troubleshooting techniques.
- 6.3 Recognize and isolate issues with input, output and storage devices.
- 6.4 Recognize the names, purposes, and appropriate application of tools.

Sample Performance Task

- Create a flow chart for troubleshooting various components, internal and external.



Standard 7.0

Students will install, configure and maintain laptop components.

The student will:

- 7.1 Identify fundamental principles of laptops and portable devices.
- 7.2 Install, configure, and upgrade, laptops and portable devices.

Sample Performance Task

- Replace optical drive in a laptop or portable device.

Standard 8.0

Students will detect problems, troubleshoot and repair/replace laptop components.

The student will:

- 8.1 Identify tools, diagnostic procedures, and troubleshooting techniques for laptops and portable devices.
- 8.2 Perform preventive maintenance on laptops and portable devices.
- 8.3 Recognize the names, purposes, and appropriate application of tools.

Sample Performance Task

- Compare the cost of replacing major components of a laptop, such as the motherboard, compared to replacing the entire device.

Standard 9.0

Students will analyze types, concepts, component and troubleshooting techniques for printers and scanners.

The student will:

- 9.1 Identify the fundamental principles of using printers and scanners
- 9.2 Identify basic concepts of installing, configuring, upgrading printers and scanners.
- 9.3 Identify tools, basic diagnostic procedures and troubleshooting techniques for printers and scanners.

Sample Performance Tasks

- Install a printer in various operating systems using different interfaces.

Standard 10.0

Students will install and configure a small office home office (SOHO) network.



The student will:

- 10.1 Identify the fundamental principles of networks.
- 10.2 Install, configure, and upgrade networks.
- 10.3 Identify tools, diagnostic procedures, and troubleshooting techniques for networks.

Sample Performance Tasks

- Install PC and Laptop network cards using various operating systems.
- Configure advanced settings for a network connection.
- Create a visual presentation comparing network technologies.
- Compare cost of network cable and connectors.

Standard 11.0

Students will compare and contrast the different Windows operating systems and their features

The student will:

- 11.1 Compare and contrast the different Windows operating systems and their features.
- 11.2 Differentiate between different Windows directory structures (Windows 2000, XP, Vista, and 7)

Sample Performance Task

- Categorize the upgrade paths and requirements for Windows 2000 and newer

Standard 12.0

Explain the process and steps to install and configure the different Windows Operating systems.

The student will:

- 12.1 Verify hardware compatibility and minimum requirements
- 12.2 Compare and contrast installation methods and options
- 12.3 Prepare a system for installation
- 12.4 Configure the installed operating system

Sample Performance Task

- Partition and format a drive, then begin the installation

Standard 13.0

Students will demonstrate proper use of user interfaces and utilities



The student will:

- 13.1 Compare and contrast common portals for exploring the file structure of each operating system.
- 13.2 Select and use system utilities/tools and evaluate the results
- 13.3 Manipulate the graphical user interface of each operating system

Sample Performance Tasks

- Visually explore the structure of the operating systems and become familiar with common locations
- Right click My Computer to access System Information, System Restore, Remote Desktop
- Utilize Task Scheduler
- Use the Control Panel to access system applets
- Evaluate the Command line use of TELNET, PING (-t -l), IPCONFIG (/all /release /renew), DIR, CHKDSK (/f /r), EDIT, COPY (/a /v /y), XCOPY, FORMAT, MD, CD, RD, NET, TRACERT, NSLOOKUP, SFC, [command name] /?
- Evaluate the RUN line commands: MSCONFIG, MSINFO32, DXDIAG, CMD, and REGEDIT
- Use Administrative Tools to access Performance Monitor, Event Viewer, Services, and Computer Management
- Run Defrag, NTBACKUP and Check Disk utilities
- Enable and disable devices, as well as looking for warnings and indicators in Device Manager
- Manipulate the Taskbar, Systray, and the Start Menu
- Access Task Manager to see the process list, resource usage, to set process priority, and to terminate a process

Standard 14.0

Students will explain the basics of boot sequences, methods and startup utilities

The student will:

- 14.1 Evaluate disk boot order and device priority
- 14.2 Access various boot options

Sample Performance Task

- Use system Recovery Options such as Automated System Recovery (ASR), Emergency Repair Disk (ERD), and Recovery Console

Standard 15.0

Students will evaluate and resolve common issues



The student will:

- 15.1 Analyze Operational Problems
- 15.2 Research error messages and conditions

Sample Performance Tasks

- Restart the print spooler
- Check for driver problems and correct
- Google the error to research the issue
- Use various online sources (Microsoft.com/KB, Google, etc.) to analyze the problem
- Create a database of information on common problems
- Break into teams, and recreate errors such as “Invalid Boot Disk”, “Inaccessible boot drive”, or “Missing NTLDR”
- View the logs of event viewer for information
- Manipulate common performance and optimization settings: Aero settings, Indexing, UAC, Side Bar, Startup file maintenance, background processes.

Standard 16.0

Students will implement security and troubleshoot common issues

The student will:

- 16.1 Evaluate security that is implemented at the software level
- 16.2 Examine security that is implemented at the hardware level

Sample Performance Tasks

- Modify Local Users and Groups to tailor security to the needs of the user
- Understand and adjust the Vista (or Windows 7) User Access control (UAC)
- Change permissions and shares of files and folders
- Discuss Encryption and User authentication
- Contrast WEP and WPA encryption and other forms of wireless security (MAC filtering)
- Understand the difference in Viruses, Trojans, Worms, Spam, Spyware, Adware, Grayware, and Malware, and discuss installation and configuration of appropriate preventative and corrective software.
- Discuss Drive Lock, BIOS passwords, and intrusion detection

Standard 17.0

Troubleshoot client-side network connectivity issues using appropriate tools

The student will:

- 17.1 Use appropriate terminology when describing network settings
- 17.2 Troubleshoot using command line utilities



Sample Performance Tasks

- Discuss the relationship between Gateway, Subnet Mask, DNS, DHCP (dynamic vs. static), and NAT (private and public)
- Demonstrate understanding of loopback addressing and automatic IP addressing
- Compare and contrast protocol settings for Mail, FTP, Proxy, and Secure connections
- Analyze firewall settings, port access, and program filters
- Utilize and interpret the results of PING, TRACERT, NSLOOKUP, NETSTAT, NET USE, NET/?, IPCONFIG, TELNET, SSH

